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10/577,723	05/02/2006	Michael Wind	289241US0PCT	3163

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EXAMINER	
GILLESPIE, BENJAMIN	

ART UNIT	PAPER NUMBER
1796	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/577,723	WIND ET AL.	
	Examiner	Art Unit	
	BENJAMIN J. GILLESPIE	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 March 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11 and 14-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11 and 14-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Note

1. The current action contains a new ground of rejection that has been necessitated by applicants' amendment filed 3/24/2010. Claim 1 never previously required the limitations of claim 13. Therefore it is proper to make the current action FINAL.

Claim Objections

2. Claim 17 is objected to because of the following informalities: Claim 17 depends from claim 13, which is now canceled. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. The U.S. Supreme Court supplied seven rationales in *KSR International* **v.** *Teleflex Inc.* (*550 USPQ2d 1385*) that, by following the factual inquiries set forth in *Graham* **v.** *John Deere*

Co. (383 U.S. 1, 148 USPQ 459 (1966)), establish a *prima facie* case of obviousness. The rationales are:

(a) Combining prior art elements according to known methods to yield predictable results;
(b) Simple substitution of one known element for another to obtained predictable results;
(c) Use of known technique to improve similar devices (, methods, or products) in the same way;
(d) Applying a known technique to a known device (, method, or product) ready for improvement to yield predictable results;
(e) "Obvious to try" – choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;
(f) Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art;
(g) Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teaches to arrive at the claimed invention.

6. The examiner notes that the above rationales are merely exemplary. For more information, see MPEP §2141.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Obviousness Rejection 1

8. **Claims 1-11, 14-15, and 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Narayan (US 4,544,763), as evidenced by Narayan (US 4,228,095), in view of Hippold et al (2003/0162933) and Duffy et al (US 5,382,602).

9. **Regarding claim 1:** Narayan ('763) teaches a method for producing isocyanate-functional prepolymers that have very low amounts of monomeric diisocyanate, said process comprising:

a. Reacting (i) diisocyanate with (ii) isocyanate-reactive polymer in the presence of (iii) catalyst to form a prepolymer

b. Stabilizing the prepolymer + catalyst with (iv) benzoyl chloride

10. Wherein (i) comprises asymmetric diisocyanate, such as 2,4'-toluene diisocyanate (TDI) and 2,4'-diphenylmethane diisocyanate (MDI) (Abstract; col 2 lines 11-22; col 4 lines 5-18).

11. Benzoyl chloride is an organo-metallic catalyst deactivator. Evidence for this is provided on column 2 lines 13-16 and column 3 lines 30-31 of Narayan ('095). Narayan ('763) adds the deactivator after the prepolymer production is completed. Narayan ('763) fails, however, to teach other deactivators suitable for dibutyltin dilaurate catalyst.

12. Column 2 lines 14-15 of Narayan ('095) and column 4 lines 38-46 of Duffy et al teach that in addition to acid chlorides – i.e. benzoyl chloride – dibutyltin dilaurate can also be deactivated with compounds such as hydrochloric acid and tartaric acid. Therefore, it would have also been obvious to utilize the deactivators of Narayan ('095) and Duffy et al since they are disclosed as being suitable for deactivating dibutyltin dilaurate, and it is prima facie obvious to add a known ingredient for its known function. *In re Linder* 173 USPQ 356; *In re Dial et al* 140 USPQ 244. Narayan ('763) also fails to teach or suggest a distillation step, as well as conducting said distillation step only after the deactivation of the catalyst.

13. Hippold et al also teach isocyanate-terminated prepolymers that are the reaction product of (i) TDI and/or MDI and (ii) isocyanate reactive polymer (Abstract; paragraph [0026]). The

prepolymer preferably exhibits monomeric diisocyanate contents as low as 0.1 wt%, which is obtained by distilling off excess monomers after the formation of the prepolymer is completed (Paragraph [0025]). Therefore, it would be obvious to subject the prepolymer of Narayan ('763) to the same distillation step of Hippold et al since Narayan ('763) also requires low monomeric diisocyanate contents, and the removal step insures almost all excess monomeric diisocyanate is removed from the prepolymer.

14. Moreover, while Hippold et al is silent with respect to a catalyst deactivation step prior to the distillation step, it would be obvious to distill off the excess monomer only after the catalyst of Narayan has been deactivated because this ensures that no further unwanted reactions occur during the distillation step. Narayan ('763) terminates the prepolymer forming reaction once the desired NCO content is obtained. If Narayan were to distill the reaction system before deactivating the catalyst, the system may continue to react during the distillation, and the desired NCO content may be lost.

15. **Regarding claims 2 and 3:** The diisocyanate of Narayan ('763) is 2,4-TDI and 2,4'-MDI.

16. **Regarding claim 4:** The catalyst of Narayan is dibutyltin dilaurate – which contains a tin (IVb) atom.

17. **Regarding claims 5-8**: Dibutyltin dilaurate has a carboxylate anion chelating system.

18. **Regarding claim 9**: Narayan ('763) takes care to insure the reaction systems of examples 3-6 are in a single phase by heating at elevated temperatures along with prolonged mixing. Thus one of ordinary skill would reasonably expect the catalyst to also be in the same phase as the reactants, and therefore be homogenous.

19. **Regarding claims 10 and 11:** As discussed in paragraphs 4-6 of the instant rejection, Narayan ('763) teaches that after the prepolymer production is completed, said prepolymer is stabilized by including catalyst deactivator – i.e. Narayan ('763) suggest that it is helpful to reduce the catalytic activity when the catalyst is no longer needed. Therefore, it would have been obvious to utilize a heterogeneous catalyst/catalyst on a support since it would allow the user to more easily removed said catalyst from the reaction system after the formation of the prepolymer.

20. **Regarding claims 14 and 15:** As previously discussed the prior art renders obvious deactivators comprising tartaric acid.

Obviousness Rejection II

21. **Claim 16** is rejected under 35 U.S.C. 103(a) as being unpatentable over Narayan ('763), as evidenced by Narayan ('095), in view of Hippold et al (2003/0162933), et al ('602) Duffy et al ('602) and Marans et al (U.S. Patent 4,061,662).

22. **Regarding claim 16:** As previously discussed, the prior art render obvious a process for producing isocyanate-terminated prepolymers having as little as 0.1 wt% of monomeric diisocyanate present. Narayan ('763) fails to teach whether the prepolymer is 'perfect' - i.e. ABA structure.

23. It would have been obvious to expect said prepolymers of Narayan ('763) to be 'perfect' since one of ordinary skill would understand that isocyanate-group in the 2-position on the 2,4-TDI is greatly hindered by a methyl group. This causes the hydroxyl-functional polymer to only react with the unhindered isocyanate group (in the 4-position) leaving the hindered isocyanate

group unconsumed. This is reinforced by Marans et al on column 3 lines 55+ and column 4 lines 1-11, which shows that when 2,4-TDI is reacted with hydroxyl-functional polymer at temperatures of about 60°C, only the unhindered isocyanate group is consumed – 60°C is the same temperature used in examples 4-6 of Narayan ('763).

24. Moreover, the MDI of Narayan ('763) is added in a large NCO:OH excess, and therefore the remaining hydroxyl groups would be overwhelmed with monomeric isocyanate – this insures the remaining free hydroxyl groups only react with monomeric diisocyanate and therefore produce a ABA prepolymer.

Response to Arguments

25. Applicant's arguments, filed 3/24/2010, with respect to claims 1-11 and 14-17 have been considered but are not persuasive.

26. Applicants argue the current rejection because although Narayan '763 teaches the inclusion of benzoyl chloride as a stabilizer after the prepolymer is formed, this stabilization is not the same a urethane catalyst deactivation. Moreover, the reliance on Narayan '095 is not relevant since benzoyl chloride is only used to reduce the activity of catalyst when the catalyst is used to form carbodiimide groups – not urethane groups.

27. In response, it is noted that Narayan '095 only teaches that benzoyl chloride as a catalyst deactivator in carbodiimide forming reactions, however, applicants are reminded of the teachings on column 4 lines 38-46 of Duffy et al which establish that acid chlorides (i.e. benzoyl chloride) can reduce the activity of the dibutyltin dilaurate when used during the formation of urethane groups. The examiner maintains that one of ordinary skill would still find it obvious to include

the additional deactivators in Narayan '763 since the Duffy et al establish the stabilizing compound of Narayan '763 act as catalyst deactivators.

28. Furthermore, it should be noted that claim 1 merely requires the catalyst be "deactivated". There is nothing that actually requires the deactivation to be for only urethane-forming reactions. Thus, even if applicants maintain that the benzoyl chloride can only be used to reduce catalytic activity during carbodiimide forming reactions – the catalyst is nevertheless "deactivated", and the "deactivated" language of claim 1 is satisfied.

Conclusion

29. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

30. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

31. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BENJAMIN J. GILLESPIE whose telephone number is (571)272-2472. The examiner can normally be reached on 8am-5:30pm.

32. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Milton Cano can be reached on 571-272-1398. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

33. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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